


11/08/98  
jc614 U.S. PTO

**CERTIFICATE OF MAILING BY "EXPRESS MAIL"**

"Express Mail" Mailing Label No. EJ324607884US.

I hereby certify that this paper or fee is being deposited with sufficient postage with the United States Postal Services "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and is addressed to: Box Patent Application, Assistant Commissioner for Patents, Washington, DC 20231

  
H. C. Chan

Nov 8, 1998  
Date

  
jc523 U.S. PTO

09/188157

11/08/98

**Docket Number: Chan-003**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**UTILITY PATENT APPLICATION TRANSMITTAL LETTER**

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Enclosed for filing is a CIP application of prior application 08/939,368 filed on September 29, 1997 by Hark C. Chan.

**Title: Information Distribution System.**

**Inventor: Hark C. Chan**

Enclosed:

- (a) Specification (17 pages; 16 claims with 3 independent claims)
- (b) Formal drawing (4 sheets)
- (c) Declaration
- (d) Small Entity Statement
- (e) IDS with 6 PTO-1449 pages.

The Commissioner is authorized to charge any other fees to Deposit Account No. 03-1243 (docket number: Chan-003). A duplicate of this page is enclosed.

Please direct all correspondence to: **Hark Chan**

**861 Brent Drive**

**Cupertino, CA 95014**

Phone: (408) 882-5063

Respectfully submitted,



---

Hark C. Chan

Date: November 7, 1998

**VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS  
(37CFR 1.9(f) & 1.27(b))-INDEPENDENT INVENTOR**Docket Number (Optional)  
Chan-003Applicant or Patentee: Hark C. Chan  
Application or Patent No.: \_\_\_\_\_  
Filed or Issued: HerewithTitle: Information Distribution System

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- ☒ the specification filed herewith with title as listed above.  
☐ the application identified above.  
☐ the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern, or organization exists.  
☐ Each such person, concern, or organization is listed below.

Separate verified statements are required from each named person, concern, or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Hark C. Chan  
NAME OF INVENTOR

  
Signature of Inventor

Date: Nov 7, 1998

Burden Hour Statement: This form is estimated to take 0.3 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO Assistant Commissioner for Patents, Washington, DC 20231.

EXPRESS MAIL LABEL NUMBER: EJ324607884US

CERTIFICATE OF EXPRESS MAILING

I hereby certify that the following paper and fee are being deposited with the United States Postal Service as Express Mail Post Office to Addressee in accordance with 37 C.F.R. 1.10 on the date indicated below, addressed to: Box Patent Application, Commissioner of Patents and Trademarks, Washington, D.C. 20231.



Hark C. Chan

Nov 8, 1998  
Date

**Docket Number Chan-003**

**INFORMATION DISTRIBUTION SYSTEM**

**Inventor: Hark C. Chan**

**Field of the Invention**

This application is a continuation in part of application Serial No. 08/939,368 filed September 29, 1997, which is a continuation in part of application Serial No. 08/644,838 filed May 10, 1996, now abandoned, which is a continuation in part of application Serial No. 08/279,424 filed July 25, 1994, now abandoned, and application Serial No. 08/255,649 filed June 8, 1994, now abandoned. These four patent applications are incorporated herein by reference.

This invention relates generally to information distribution, and more particularly to distributing information using a broadcast channel and a bi-directional communication channel.

**Background of the Invention**

Recent advancements in modem and computer technology allow large amount of digital data to be transmitted electronically. A number of information providers (such as newspaper and magazine publishers) and on-line information distributors

1 have formed partnerships to deliver newspaper and other information on-line. In this  
2 system, a subscriber uses a computer and a modem to connect, through a regular  
3 phone line, to the computer of an on-line information provider. The subscriber can  
4 retrieve information, including newspaper articles, stored in the computer of the  
5 information provider.

6 On-line delivery of newspaper has many advantages. For example, the  
7 information can be updated throughout the day while the printed version is printed  
8 only once or twice a day. Further, it is possible to do text-based searches on the  
9 information. However, it is found that on-line deliver of newspaper and other  
10 information is slow. For example, a subscriber has to wait many seconds for a  
11 newspaper article to be delivered. The quality of the electronic newspaper is low.  
12 For example, in order to reduce storage and communication requirements, graphic  
13 images appeared in the printed version are not universally supplied in the on-line  
14 version of newspaper. One of the reasons for such poor performance is the limited  
15 bandwidth of communication channels used by on-line information distributors.  
16 Another reason is that information is centrally processed by the computer at the site  
17 of the information distributor, with the result that each subscriber only gets a small  
18 slice of the time of the computer.

## 19 20 **Summary of the Invention**

21 The present invention uses two channels to deliver digital information: a  
22 broadcast channel and a bi-directional channel. The broadcast channel is used to

1 deliver the bulk of the digital information to subscribers. The amount of  
2 information delivered is preferably sufficient to satisfy the needs of a large number of  
3 subscribers so that they do not have to obtain additional information using the bi-  
4 directional channel. The broadcasted information is stored on fast storage media  
5 located at subscriber sites. As a result, search and retrieval of the broadcasted  
6 information is quick. Further, the broadcasted information is processed locally using  
7 a dedicated on-site processor instead of relying on the computers of the information  
8 distributors. As a result, the load on the computers of the information distributors is  
9 reduced. If the subscribers desire to receive additional information relating to the  
10 broadcasted information, the bi-directional communication channel is used to  
11 transmit the request and the requested information.

12 The distribution costs of broadcast channels are typically much lower than  
13 that of a bi-directional communication channel. Consequently, the major portion of  
14 information is delivered using low cost distribution channels. For a large number of  
15 subscribers, the broadcasted information will provide all the information they  
16 normally need. Thus, expensive bi-directional communication channels are used only  
17 occasionally.

18 These and other features and advantages of the present invention will be fully  
19 understood by referring to the following detailed description in conjunction with the  
20 accompanying drawings.

## **Brief Description of the Drawings**

Fig. 1 is a schematic drawing showing an information distribution system of the present invention.

Fig. 2A shows a newspaper article as displayed on a monitor of the information distribution system shown in Fig. 1.

Fig. 2B shows the contents of the broadcast information that corresponds to the newspaper article of Fig. 2A.

Fig. 3 shows another embodiment of the information distribution system of the present invention.

Fig. 4 is a schematic drawing showing another information distribution system of the present invention.

## **Detailed Description of the Invention**

Fig. 1 is a block diagram of an information distribution system 100 in accordance with the present invention. In this embodiment, system 100 is designed to electronically distribute newspaper. It should be pointed out that system 100 can also be used advantageously to distribute other types of information. System 100 contains a plurality of subscriber units (such as units 102 and 104) each connected to a bi-directional communication channel (e.g., telephone connections 106 and 108 coupled to units 102 and 104, respectively) and a satellite transponder 110 for broadcasting digital data to these subscriber units. Telephone connections 106 and 108 (which could be line-based or wireless) are coupled to a central database 109. In

1 system 100, satellite transponder 110 is used to broadcast the content of a newspaper  
2 to the subscriber units while telephone connections 106 and 108 are used to provide  
3 additional information (stored in central database 109) to subscriber units 102 and  
4 104, respectively, on a demand basis.

5 The structures of these subscriber units are substantially identical;  
6 consequently, only one of these units, such as unit 102, is described in detail. Unit  
7 102 contains an antenna 116 for receiving broadcast signals from satellite transponder  
8 110, a signal/data processor 118 for performing signal and data processing functions, a  
9 monitor 120 for displaying the electronic newspaper, and an input device 122 (such as  
10 a keyboard and/or a mouse).

11 Signal/data processor 118 contains a transponder interface 132 for processing  
12 transponder signal received from antenna 116. Transponder interface 132 typically  
13 contains a low noise receiver for receiving high frequency (e.g., C or Ku band)  
14 transponder signal and a "universal data interface" for converting the transponder  
15 signal to digital data. The retrieved data is stored in nonvolatile storage 134, such as a  
16 hard disk or solid state flash memory. Preferably, satellite transponder 110  
17 broadcasts the newspaper data at predetermined times. Thus, a real-time clock 136 is  
18 preferably used to turn on interface 132 at the predetermined times. Processor 118  
19 contains a microcomputer 140 that coordinates the operation of clock 136,  
20 nonvolatile storage 134, and interface 132. Processor 118 also contains a  
21 communication interface 142 for sending and receiving digital data from central  
22 database 109 through telephone connection 106.



1           The time for broadcast is preferably chosen when communication load of  
2   transponder 110 is at a low level (e.g., around mid-night). As a result, the cost of  
3   information delivery is low. Alternatively, the time of broadcasting is chosen by  
4   transponder 110 because it knows when communication load is light. In this case,  
5   transponder 110 first sends a signal to signal/data processor 118 for alerting processor  
6   118 to receive and process the newspaper information.

7           A user can use the input device 122 and monitor 120 to read the content of the  
8   electronic newspaper stored in nonvolatile storage 134. In this embodiment, the  
9   complete content of the newspaper is stored in nonvolatile storage 134. The term  
10   "complete content" means that the user is able to read the newspaper without relying  
11   on information stored in central database 109 (although other embodiments may  
12   deliver less than the complete content). In this aspect, system 100 functions in a  
13   similar way as the distribution of a conventional printed newspaper. However, the  
14   digital data of the electronic newspaper delivered by satellite transponder 110  
15   preferably contains linkage reference that allows fast retrieval of additional  
16   information from central database 109.

17           If the newspaper information received from satellite transponder 110 is  
18   sufficient to satisfy the needs of a user, signal/data processor 118 will not activate  
19   telephone connection 106. However, if the user wishes to receive additional  
20   information relating to an item mentioned in the electronic newspaper (e.g., by  
21   selecting at the item using the input device), process 118 will retrieve the information  
22   stored in central database 109 using the embedded linkage reference.

1 In system 100 of the present invention, the complete content of the electronic  
2 newspaper (including graphics and other multimedia contents, if delivered) is stored  
3 in nonvolatile storage 134, which has fast access time. Further, a dedicated processor  
4 (i.e., microcomputer 140) is used to process newspaper information. On the other  
5 hand, prior art on-line newspaper distribution systems rely on modem to deliver the  
6 content of the newspaper stored in a central site. Further, the processor in the central  
7 site has to serve many users in delivering the newspaper. As a result, system 100 has  
8 superior performance compared to the prior art on-line newspaper delivery systems.

9 If it is desirable to limit circulation of the newspaper to a certain class of  
10 subscribers only (e.g., paid subscribers), the data transmitted by transponder 110  
11 could be encrypted. As a result, only subscribers who have a decryption key are able  
12 to read the newspaper. In the case, microcomputer 140 also performs decryption  
13 functions.

14 Fig. 2A shows an example of a portion of a newspaper article as seen on  
15 monitor 120. In Fig. 2A, the terms that a user may obtain additional information are  
16 underlined (or highlighted in other ways, such as setting in different colors,  
17 depending on the choice of the publisher). If desired, the user may select these terms  
18 using a pointing device, such as a mouse, and signal/data processor 118 will obtain  
19 the additional information from central database 109.

20 Fig. 2B shows the same portion in Fig. 2A as transmitted by transponder 110  
21 (for simplicity, the embedded formatting codes, such as center, bold, etc., are not  
22 shown). Each of the terms underlined in Fig. 2A are enclosed by a special symbol

1 (e.g., the "∇" symbol) and followed by a linkage reference enclosed by another  
2 special symbol (e.g., the "⌘" symbol). These symbols are invisible to the users and  
3 are recognizable only by microcomputer 140.

4 When an underlined term in Fig. 2A is selected by a user, microcomputer 140  
5 extracts the linkage reference and transmits it to central database 109. The linkage  
6 reference allows central database 109 to retrieve the necessary information quickly  
7 without doing extensive searches. As a result, the response time of system 100 is fast.  
8 The retrieved information can itself contains linkage references and can be searched.

9 If the speed of searching and retrieving data by central database 109 is fast, it  
10 may not be necessary to include linkage reference in the information broadcasted by  
11 transponder 110. In this case, the user selects (e.g., using the mouse) words and terms  
12 he/she is interested in. Signal/data processor 118 transmits the selected items to  
13 central database 109, which searches for matches in its database. Matched  
14 information is sent to subscriber unit 102 for processing.

15 The bi-directional channel also allows updating of the broadcasted  
16 information. There is typically a time difference between the broadcast and display of  
17 information. New information gathered during this time difference can be stored in  
18 central database 109 and later transmitted to signal/data processor 118.

19 In this embodiment of the present invention, satellite transponder 110 is used  
20 as the vehicle to electronically broadcast newspaper. However, other broadcast  
21 distribution methods can be used. In the present invention, broadcast is defined as  
22 one-to-many distribution of information. The broadcast distribution channels do not

1 have to be electrical. For example, the present invention allows the distribution of  
2 compact disc read-only memories (CDROMs) encoded with digital information to  
3 the subscriber sites. In the case of electrical broadcast communication channels, both  
4 wired and wireless can be used. Preferably, unidirectional channels are used for  
5 broadcast because of their low cost; however, the present invention does not preclude  
6 the use of bi-directional communication channels (such as telephone lines) as means  
7 for distributing broadcast (i.e., one to many) information.

8 Fig. 4 is a schematic diagram of another information distribution system of  
9 the present invention. Similar elements in Figs. 1 and 4 have the same reference  
10 numerals. In Fig. 4, a plurality of CDs (such as CDs 152 and 154) encoded with the  
11 above described information are distributed to subscriber units 102 and 104. Instead  
12 of antennas and transponder interfaces, subscriber units 102 and 104 contains CD  
13 readers (such as CD reader 156).

14 Current technology allows the size of antenna 116 to be as small as 2 feet.  
15 The costs of antenna 116 and transponder interface 132 are already low enough to be  
16 within the reach of small business or a typical household. The newspaper publisher  
17 has to pay for the use of the transponder. However, the costs are comparable to the  
18 printing and distribution costs of printed newspaper. It is anticipated that the costs  
19 of the newspaper distribution system in accordance with the present invention will  
20 be lowered as the number of subscribers increases.

21 Fig. 3 shows another embodiment of a newspaper distribution system 200 of  
22 the present invention. System 200 contains a satellite transponder 210, an earth

station 214, and a plurality of subscriber units, such as units 222 and 224. Transponder 210 functions in a similar way as transponder 110 of Fig. 1 and subscriber units 222 and 224 function in a similar way as subscriber units 102 and 104 of Fig. 1. Earth station 214 receives digital data transmitted by transponder 210 using an antenna 216. The data is distributed to subscriber units 222 and 224 via wired communication channel 228, such as cable and optic fiber. Other earth stations could be placed in strategic locations throughout the country to serve their respective subscribers in a similar manner as earth station 214 and subscriber units 222 and 224. As a result, a large geographic area can be served simultaneously by satellite transponder 210. The advantage of this embodiment is that the equipment costs incurred by the subscriber units are low.

In some locations, it may not be desirable to use wired communication channel to link an earth station to subscribers. In such case, wireless communication channel could be used. Fig. 3 shows an earth station 234 that receives transponder signal from transponder 210 using an antenna 236. Earth station 234 in turn broadcasts the digital data to its subscribers, such as subscriber units 242 and 244.

In one embodiment of system 200, teletext technology is used to link earth station 234 and subscriber units 242 and 244. Thus, earth station 234 could be located adjacent to a television transmission station. The digital data received by earth station 234 can be integrated to the vertical blanking interval of a TV signal, which is broadcasted using an antenna 238. Subscriber units 242 and 244 receive the signal using antennas 239, and 240, respectively. The digital data is then retrieved.

1 Various improvements and refinements of the teletext technology are well known  
2 and can be incorporated into system 200.

3 It should be obvious to a person skilled in the art that systems 100 and 200 are  
4 not limited to the distribution of newspaper. Further, electronic newspapers of the  
5 future may contains contents which are not available in the printed version, such as  
6 video and other multimedia compositions. Other information, such as magazines,  
7 graphic images, electronic mails, computer games, multimedia work, or interactive  
8 movie, could also be advantageously distribution using a system similar to systems  
9 100 and 200. For example, if it is desirable to distribute interactive movie, the non-  
10 interactive portion can be broadcasted while the interactive portion is delivered using  
11 a bi-directional channel.

12 There has thus shown and described a novel information distribution system.  
13 Many changes, modifications, variations and other uses and applications of the subject  
14 invention will become apparent to those skilled in the art after considering this  
15 specification and the accompanying drawings. All such changes, modifications,  
16 variations, uses, and applications are covered by the scope of this invention which is  
17 limited only by the appended claims.

18 //

1           **I Claim:**

2

3           1.       A method for distributing digital data to a plurality of remote sites

4       each having a processing device and a display device, comprising:

5           generating a first set of digital data;

6           encoding each of a plurality of portable read-only storage devices with said

7       first set of digital data;

8           distributing said plurality of storage devices to said plurality of remote sites;

9           providing a database containing a second set of digital data and means for

10       remotely communicating with said sites using a bi-directional channel;

11          said first set of digital data comprising a plurality of regular displayable items,

12       a plurality of formatting codes, a plurality of special displayable terms, a first non-

13       displayable symbol, a plurality of linkage references, and a second non-displayable

14       symbol, said special displayable terms being highlighted when displayed by said

15       display device, said first non-displayable symbol being used by said processing device

16       for recognizing said displayable terms, said second non-displayable symbol being used

17       by said processing device for recognizing said plurality of linkage references, each of

18       said plurality of linkage references being used for retrieving a portion of said second

19       set of digital data, and each of said plurality of special displayable terms being

20       associated with one of said plurality of linkage references;

1           said means for communicating comprising means for accepting at least one of  
2           said linkage references transmitted by at least one of said sites using said bi-directional  
3           channel;

4           searching, by said database, for a portion of said second set of digital data  
5           referenced by said at least one linkage reference; and

6           sending, by said database, said portion to said at least one site via said bi-  
7           directional channel.

8  
9           2.       The method of claim 1 wherein said first set of digital data is  
10          encrypted.

11  
12          3.       The method of claim 3 wherein said storage devices are CDROMs.

13  
14          4.       The method of claim 1 wherein said storage devices are optically  
15          encoded storage devices.

16  
17          5.       The method of claim 1 wherein at least one of said plurality of  
18          displayable items contains text-based characters.

19  
20          6.       The method of claim 1 further comprising the step of periodically  
21          updating parts of said second set of digital data.

22



1           7.       The method of claim 1 wherein said each of said plurality of special  
2       displayable terms are enclosed between a pair of said first non-displayable symbol and  
3       each of said plurality of linkage references are enclosed between a pair of said second  
4       non-displayable symbols

6           8.       An information distribution system for distributing digital data to be  
7       displayed in a plurality of remote sites each having a processing device and a display  
8       device, comprising:

9           a plurality of portable read-only storage devices each encoded with a first set  
10       of digital data, said storage devices being distributed to said plurality of remote sites;

11          a database containing a second set of digital data and means for remotely  
12       communicating with said sites using a bi-directional channel;

13          said first set of digital data comprising a plurality of regular displayable items,  
14       a plurality of formatting codes, a plurality of special displayable terms, a first non-  
15       displayable symbol, a plurality of linkage references, and a second non-displayable  
16       symbol, said special displayable terms being highlighted when displayed by said  
17       display device, said first non-displayable symbol being used by said processing device  
18       for recognizing said displayable terms, said second non-displayable symbol being used  
19       by said processing device for recognizing said plurality of linkage references, each of  
20       said plurality of linkage references being used for retrieving a portion of said second  
21       set of digital data, and each of said plurality of special displayable terms being  
22       associated with one of said plurality of linkage references;

1           said means for communicating comprising means for accepting at least one of  
2           said linkage references delivered by at least one of said sites; and

3           means in said database for searching for a portion of said second set of digital  
4           data referenced by said at least one linkage reference and for sending said portion to  
5           said at least one site via said bi-directional channel.

6  
7           9.       The system of claim 8 wherein said storage devices are CDROMs.

8  
9           10.     The system of claim 8 wherein said read-only storage devices are  
10          optically encoded storage devices.

11  
12          11.     The system of claim 8 wherein at least one of said special displayable  
13          terms contains text-based characters.

14  
15          12.     The system of claim 8 further comprising means for periodically  
16          updating parts of said second set of digital data.

17  
18          13.     The system of claim 8 wherein each of said plurality of special  
19          displayable terms are enclosed between a pair of said first non-displayable symbol and  
20          each of said plurality of linkage references are enclosed between a pair of said second  
21          non-displayable symbol.



## ABSTRACT

An information distribution system encodes a first set of digital data on a plurality of portable read-only storage devices. Additional information is stored in a database that is accessible by using a bi-directional channel. The first set of digital data contains a plurality of special displayable terms, a first non-displayable symbol, a plurality of linkage references, and a second non-displayable symbol. A user can select at least one special displayable term. The linking reference associated with the selected special displayable term is sent to the database via the bi-directional channel. The database uses the linking reference to search for information, and returns the resulting information to the user.



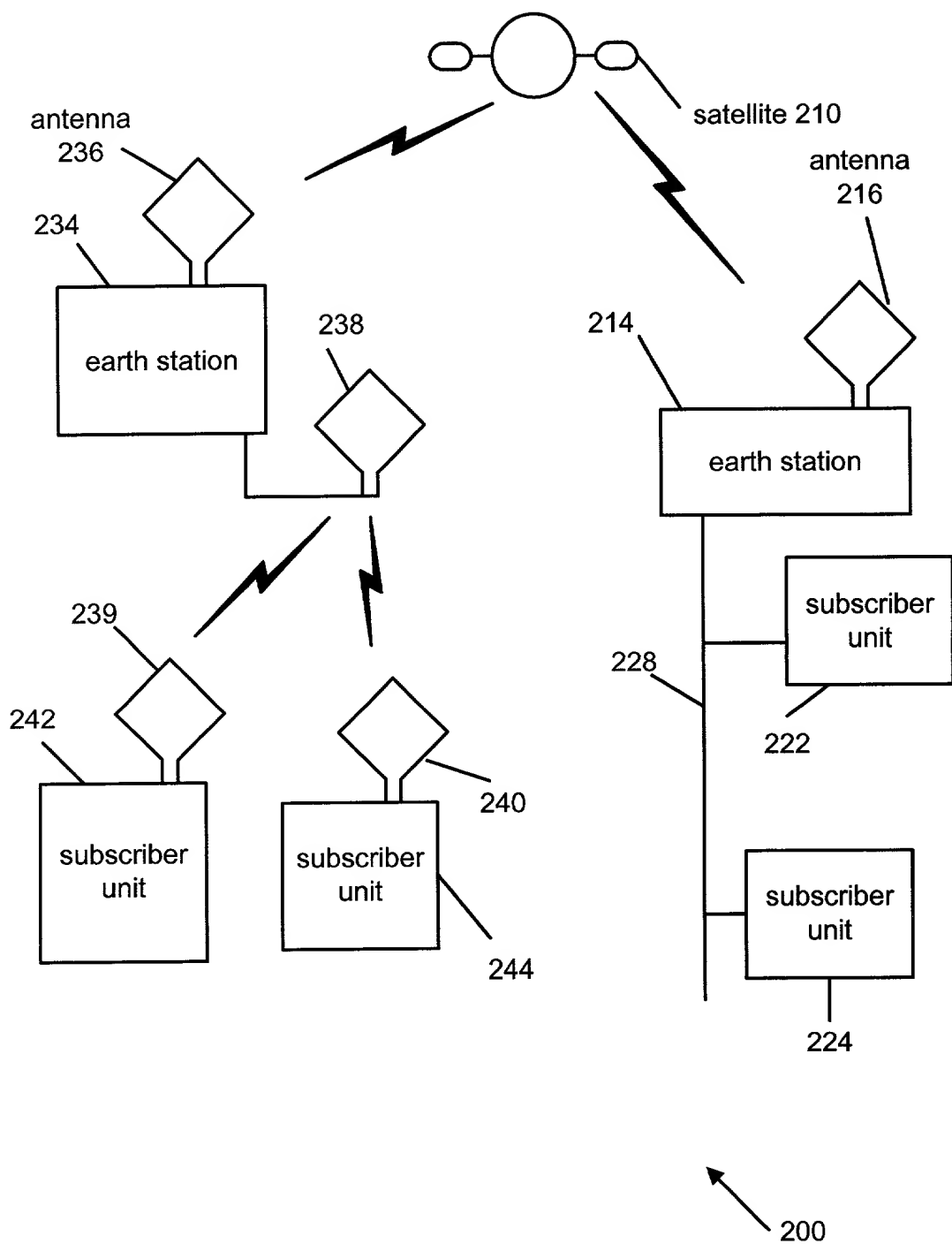
## K-S Particle Found

Two physicists announced that they had found the K-S particle. If confirmed, this will verify the theory of the Nobel laureates, Professors Kendrick Chan and Sophia Chan, who first postulated the existence of the K-S particle ten years ago. The physicists, Drs. Lisa Smith and John Doe, showed computer generated results indicating the detection of the K-S particles in a series of experiments carried out at the International Super-High Energy Accelerator.

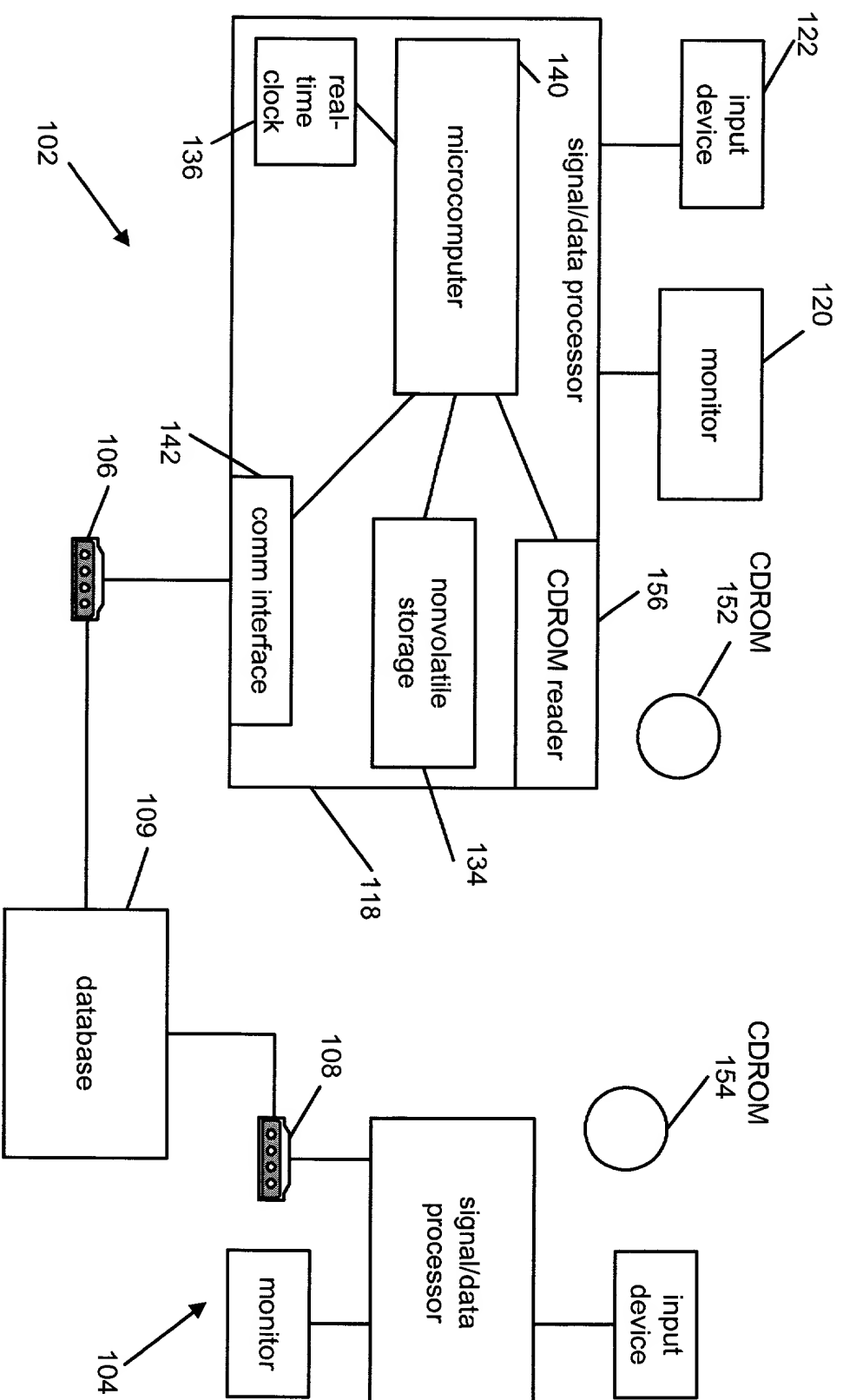
FIG. 2A

K-S Particle Found¶¶ Two physicists announced that they had found the ¶K-S particle¶FE330AB¶. If confirmed, this will verify the theory of the Nobel laureates, Professors ¶Kendrick Chan¶A245DC8¶ and ¶Sophia Chan¶85AC258¶, who first postulated the existence of the K-S particle ten years ago. The physicists, Drs. ¶Lisa Smith¶3098BE6z¶ and ¶John Doe¶EAC7835¶, showed computer generated results indicating the detection of the K-S particles in a series of experiments carried out at the ¶International Super-High Energy Accelerator¶C347A49¶.¶

FIG 2B



**Fig. 3**



**Fig. 4**



## DECLARATION FOR UTILITY PATENT APPLICATION

As below-named inventor, I hereby declare that:

My name, residence address and country of citizenship are as stated below.

Name: Hark C. Chan  
Address: 861 Brent Drive, Cupertino, CA 95014  
Citizenship: USA

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

### INFORMING DISTRIBUTION SYSTEM

the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulation, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<u>08/939,368</u>	<u>September 29, 1997</u>	<u>pending</u>
<u>08/644,838</u>	<u>May 10, 1996</u>	<u>abandoned</u>
<u>08/279,424</u>	<u>July 25, 1994</u>	<u>abandoned</u>
<u>08/255,649</u>	<u>June 8, 1994</u>	<u>abandoned</u>
(Application Serial No.)	(Filing Date)	(Patented, Pending, Abandoned)

I hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signatures of Inventor

Date

  
(Hark Chan)

Nov 7, 1998